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OPERATIONS FOR GLAUCOMA, OCCURRING IN THE  
PRACTICE OF C. R. AGNEW, M. D.

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REPORTED BY DAVID WEBSTER, M. D., NEW YORK.

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1. CASES IN WHICH IRIDECTOMY WAS PERFORMED ON BOTH EYES  
AT VARYING INTERVALS.

CASE I. Oct. 25, 1873, Miss S. H. J., aged 36, was formerly occupied in making fine rosettes for horse harnesses, but had to quit the work six months ago on account of her eyes, and has since been engaged in packing fruit. General health poor; is nervous and subject to sick headaches. First noticed pain over eyebrows about ten months ago, after reading. For two weeks after that she could not see objects straight ahead, but only to the temporal side of the fixation point with either eye. She first saw "rainbows" about lights last winter, and more or less ever since. She was annoyed by double vision for a week or two in May.

The pupils are both dilated and sluggish, but the left more so. Both anterior chambers are shallow, and the tension of both eyes is increased, but the right is more so.

R. V.=Counts fingers with some uncertainty at 18"; visual field 4" vertically and 4" horizontally, and wholly to temporal side of fixation point.

L. V. =  $\frac{20}{L}$ ; made  $\frac{20}{XX}$  with  $+\frac{1}{30}$ . Supero-nasal half of field absent close up to the point of fixation.

*Ophthalmoscopic Examination.*—Right eye, media so turbid that it is impossible to measure the depth of the excavation. Left eye, media clear, excavation 1.55 mm., marked arterial pulsation.

Oct. 30. Iridectomy upwards on the right eye, under ether. Slight hemorrhage into anterior chamber. No atropine. Flannel bandage with charpie.

Nov. 1. No pain. Blood mostly absorbed from anterior chamber.

Nov. 13. The eye has healed very kindly and the patient thinks she sees better with it than before the operation. The left eye seems to be gradually failing. It is slightly painful at times, though not reddened, and the visual field is becoming more contracted.

Nov. 14. Iridectomy upwards on left eye, under ether. Some bleeding from cut edges of iris. No vomiting from the ether after either operation.

Dec. 5. The left eye has healed as kindly as the right; visual field much enlarged; vision =  $\frac{20}{XX}$ .

March 23, 1874. Right visual field enlarged to 5" vertically, and 10" horizontally, and is very irregular in outline. The patient has lately been troubled with neuralgia and photopsiæ of right eye. Ordered cod liver oil with lime and strychnia.

April 13. Most of upper half of visual field of left eye is gone, but central vision remains =  $\frac{20}{XX}$ . Has very little neuralgia.

CASE II. Feb. 11, 1873. R. B. T., aged 54, physician, has noticed failing vision in his right eye for the last six months. R. V. =  $\frac{20}{XL}$ ; not improved by glasses; visual field much reduced in size. Tension slightly increased. L. V. =  $\frac{20}{XX}$ , E.; visual field normal.

*Ophthalmoscopic examination:* Right eye, pulsating veins, broad excavation of optic disk, choroidal atrophy between disk and macula. Left eye, some cupping of optic disk.

Feb. 15. Iridectomy upward on right eye, under ether.

Feb. 22. The visual field is about twice as large as before the operation.

Nov. 2, 1875. Six weeks ago had a total obscuration of vision of left eye, occurring in the morning while dressing, lasting half an hour and then passing off suddenly, vision returning as good as before. Two weeks ago had a similar attack, lasting a little less than half an hour. This also occurred in the morning while dressing. Four days ago a total loss of sight occurred for the third time. The blindness this time came on in the morning just after dressing, and the sight began to return about noon. Vision has since improved very slowly, and he can now count fingers with that eye at 18" in the middle of a visual field measuring 25" vertically and 15" horizontally at one foot. The iris is bulged forward and the tension increased.

*Ophthalmoscopic examination:* Media clear, glaucomatous excavation of papilla  $\frac{1}{2}$ ; arterial pulsation.

Nov. 3. Iridectomy upward, under ether. No bleeding into anterior chamber. No vomiting. Dressed with charpie and flannel bandage.

Nov. 16.  $V. = \frac{2}{cc}$ . Anterior chamber leaked for *eleven days* after the operation.

Nov. 17.  $V. = \frac{4}{cc}$ . Excised a chalazion through the edge of his eyelid. The patient was now allowed to return to his home in Virginia.

May 28, 1878. R. V. =  $\frac{20}{L}$ , L. V. =  $\frac{6}{cc}$ , in temporal portion of field. •

April 2, 1883. "The distinguished physician, R. B. T., dropped dead from heart disease at his home yesterday"—(*New York Herald*).

CASE III. March 10, 1883. Wm. R., aged 60, agent, says that three years ago left eye began to feel rough, as though fine dust were in it. In six months the sight began to be poorer than that of the fellow eye. Lately, the sight of the right eye has begun to be defective. No external signs of eye disease.

R. V. =  $\frac{20}{L} +$ ;  $\frac{20}{xx}$  with  $+\frac{1}{2}$ .

L. V. =  $\frac{20}{c} +$ ; no improvement with glasses.

March 22. Glaucoma simplex, both eyes. Right disk cupped  $\frac{1}{2}$ ; scleral ring; a small artery running along the bottom of the cup and out to the temporal side of the retina pulsates. Left disk cupped  $\frac{1}{10}$ ; lamina cribrosa visible; scleral ring; pupil

sluggish. Tension slightly increased in left. Patient never saw halos about lights, nor had colored vision, nor saw flashes of light. No subjective symptoms can be elicited except that of impairment of sight, which he has noticed two and a half years. His nervous system has been weak for several years. Has worn glasses +  $\frac{1}{4}$  for two or three years. Both visual fields are limited, the left much more extensively than the right.

April 8. R. V. =  $\frac{20}{XX}$  with +  $\frac{1}{4}$ . L. V. =  $\frac{20}{LXX}$ ; no improvement with glasses.

Aug. 16. R. V. =  $\frac{20}{XX}$  with +  $\frac{1}{4}$ . L. V. =  $\frac{20}{L}$ ; no improvement with glasses.

Dec. 11. R. V. =  $\frac{20}{XX}$  with +  $\frac{1}{4}$ . L. V. =  $\frac{20}{LXX}$ —; no improvement with glasses.

Dec. 18. R. V. =  $\frac{20}{XX}$  with +  $\frac{1}{4}$ . L. V. =  $\frac{20}{L}$ .

Iridectomy upward on left eye, under cocaine. The patient said he felt all the steps of the operation, but that there was no pain connected with it.

The left eye was bandaged with absorbent cotton and a flannel bandage, and both were covered with a black silk shade.

Dec. 26. There has been no pain or inflammatory reaction, but there has been a leakage of aqueous humor until to-day.

March 23, 1885. L. V.  $\frac{20}{LXX}$ . Patient thinks the operation arrested the loss of vision in the left eye, but has recently noticed that the visual field of the right eye was becoming more contracted. This he notices more especially in reading. In reading along he sees the word he is reading, but not beyond it.

R. V. =  $\frac{20}{XX}$  slowly with his glass.

April 4. Thinks vision of right eye is becoming more indistinct and is narrowing.

R. V. =  $\frac{20}{XX}$ . L. V. =  $\frac{20}{LXX}$  +.

May 16. R. V. =  $\frac{20}{XX}$  with +  $\frac{1}{4}$ . L. V. =  $\frac{20}{LXX}$ ; no improvement with glasses.

Right eye, tension increased; arterial pulsation the same as when noted at first; patient complains that he can read only a few minutes at a time because it tires his right eye so. There seems to be such a straining effort, and it makes him so nervous. He does not see so well in the street as formerly without his glasses.

May 19. Iridectomy upon right eye, upward, under cocaine.

May 30. The eye has recovered without reaction; very little redness remains about the wound; V. =  $\frac{20}{xxx}$ .

CASE IV. May 25, 1877, E. B., aged 55, laborer, states that his sight began to fail about four years ago, first in the left, and soon after in the right eye. He did not know that his sight was failing until he found that he could not read print. He had slight pains in his eyes at that time and occasionally subsequently. He has seen, "rainbows" about lights frequently. He has noticed that his vision is better in the mornings and afternoons than in the middle of the day. An ophthalmic surgeon of Hartford performed an iridectomy upwards on the right eye last May, and another downwards on the same eye in August.

R. V. = Counts fingers at two feet.

L. V. = Counts fingers at one foot.

Right visual field 17" vertically and 15" horizontally. Left field 16" vertically and 13" horizontally, at distance of one foot. No pain in either eye at present. Tension increased in both. Left pupil dilated. Corneal and lenticular opacities of both, but the optic disks can be seen sufficiently well to show glaucomatous excavation and a broad scleral ring about them.

May 28. Iridectomy upwards on left eye.

June 6. Only insignificant pain up to date. R. V. = fingers at 4.' Visual field 27" x 23." L. V. fingers at 2.' Visual field 16" x 17."

June 9. Atropine has been used but once during recovery. Patient discharged to-day expressing himself as feeling much benefited.

## 2. CASES IN WHICH ONLY ONE EYE WAS OPERATED ON.

CASE I. May 8, 1876. James D., a laborer, aged 44, six weeks ago happened to close his right eye and found that his left eye was nearly blind. The sight has since remained unchanged. He gives no history of pain, photopsia or chroma-topsia.

R. V. =  $\frac{20}{xxx}$ . No improvement with glasses.

L. V. = Counts fingers at four feet.

Ophthalmoscopic examination shows a shallow excavation of the right optic disk, while the left disk is so excavated as to be myopic  $1\frac{1}{2}$ .

The diagnosis of chronic glaucoma having been made the patient was placed under ether, and an iridectomy was done upon the left eye. While recovering from the effects of the anæsthetic this patient's struggles were usually violent.

May 9. No pain since operation; feels well this morning; chemosis in region of wound; bandage left off and iced cloths applied.

May 10. Less chemosis; no pain; atropine and iced cloths.

May 12. Anterior chamber still empty.

May 16. Cystoid cicatrix forming; some pain.

May 26. Eye about the same. Patient went from under observation without his amount of vision being noted.

CASE II. Sept. 23, 1880. M. W., aged 60, a boot fitter, came to the Manhattan Eye and Ear Hospital with *glaucoma absolutum* of the right and *glaucoma simplex* of the left.

Left eye shows cupping of disk with marked atrophy. Visual field at one foot about four inches in all directions from the point of fixation except nasalward, where it is five inches.

Sept. 26. Iridectomy upwards, on left eye, under ether. No notes were made of the case at the hospital subsequent to the operation, but through the kindness of Dr. H. G. Miller, of Providence, I am able to give the condition of his eyes six and a half years after the operation. Dr. Miller's examination being made on April 11, 1877.

"O. D. *glaucoma absolutum*; T+2.

O. S. Tn. V. =  $\frac{5}{18}$ . (Sn. metric).

No irritation about cicatrix; slight bulging, especially at extremities of wound. Estimated depth of excavation 1.36 mm. by Knapp's tables. The field of vision is almost wholly confined to the infero-nasal quadrant, and extends about 30°. It scarcely extends at all above the horizontal line, so that when he is writing on one line he does not see the line already written above it. In his own estimation, and in mine also, there has been no material change in the sharpness of central vision since I saw him some months after the operation."



In this case the eye affected with glaucoma absolutum was left undisturbed because it had long remained quiet, and Dr. Agnew hoped that it would continue indefinitely in that condition. The sequel seems to have proved the wisdom of the course pursued.

CASE III. April 30, 1877, R. S., æt. 35, carpenter, has had occasional pain in right eye for two months, "a heavy, dull feeling." He thinks that he can see better in the morning and that the eye feels worse after being used. He has never seen rainbows about lights. The visual field of the left eye is normal and its central vision  $\frac{20}{20}$ , with a manifest hypermetropia of  $\frac{1}{30}$ .

R. V. =  $\frac{20}{60}$ ; Hm.  $\frac{1}{10}$ ; visual field about circular and measures five inches in all directions from the fixation point when tested at one foot. The right pupil is slightly dilated and sluggish and the anterior chamber a little shallow. The tension is perceptibly increased.

*Ophthalmoscopically*, the left eye presents no lesion. The right disk is excavated to a depth of 1.55 mm.; delicate changes in the retina, apparently due to cholesterine deposits, are scattered between the disk and the macula. The media are transparent.

May 11. R. V. =  $\frac{20}{60}$ ; visual field nine inches in all its diameters. Iridectomy upwards, under ether. Considerable bleeding from the wounded iris.

May 12. Anterior chamber empty except as it is partly filled with blood. Slight inflammatory reaction. Atropine dropped into the eye.

May 15. Anterior chamber still contains some blood and very little aqueous. The aqueous humor, as fast as generated, escapes into the subconjunctival connective tissue, forming a large bleb over the insertion of the superior rectus, and giving the whole ocular conjunctiva a watery, glistening, baggy appearance.

May 20. The aqueous is still leaking beneath the conjunctiva.

May 23. For the first time since the operation, a period of twelve days, the anterior chamber is partly established. The vision is  $\frac{10}{60}$  and the eye is looking well.

May 25. The subconjunctival bleb is nearly gone, and the anterior chamber almost of normal depth.

V. =  $\frac{20}{6}$  with  $+\frac{1}{10}$  c, axis  $90^{\circ}$ .

May 30. V. =  $\frac{20}{1 \times 1 \times 1}$  with  $-\frac{1}{10}$ . Anterior chamber of normal depth and baggy appearance of ocular conjunctiva entirely absent.

June 27. V.  $\frac{20}{1 \times 1 \times 1}$  with  $-\frac{1}{10}$ . Visual field, tested at one foot, measures twenty-six inches vertically and forty inches horizontally, all the nasal portion of the retina responding to light.

CASE IV. Dec. 30, 1874, Miss C. P., aged 71, says that a little over a year ago she arose one morning with headache which lasted all day and kept her awake all the following night. The pain was all through her head, but was worse in the right eye, which seemed to be the centre of the trouble. In the early part of this summer she first noticed a dimness of the sight of the right eye, as though looking through a mist or veil. This dimness has always been present since, but has varied in density. Her left eye is weak, she thinks from sympathy. She has refrained from the use of her eyes for near work for the last two months. Her nervous system is weak, she having had an affection of the spine for many years. She was struck upon the right side of her head, a year ago last summer, by the lid of a trunk. Not long after a paper box fell on the top of her head, after which, although not unconscious, she was unable to speak for several minutes from inability to remember words.

R. V. =  $\frac{20}{1 \times 1 \times 1}$  }  
L. V. =  $\frac{20}{1 \times 1 \times 1}$  } No improvement with glasses.

Ophthalmoscopic examination shows incipient cataract, changes about the macula, and commencing atrophy of the optic nerves, both eyes.

May 4. The patient was seen by Dr. H. Knapp, who kindly sent the following notes of his examination:

"R. V. =  $\frac{20}{6}$ , L. V. =  $\frac{20}{1 \times 1 \times 1}$ . Both optic nerves atrophic looking, left partially excavated, right not. Field of left complete, right field contracted inward and downward to point of fixation. Right tension increased (+1), left tension normal. Cataracta incipiens and shallow anterior chamber in both."

May 12. Iridectomy upwards on right eye, under ether, be-



fore breakfast. The patient took the anæsthetic quietly and there was no vomiting. The iridectomy was broad and peripheral. Some bleeding from the limbus occurred, but not into the pupil. No iris was left in the wound. The eyes were dressed with picked lint, a flannel bandage, and a covering of black silk.

May 13. Anterior chamber is refilled.

May 29. Patient has had no pain, but at times a most intolerable itching of the eye, "worse than pain," as she said. The redness of the eyeball has been very slight during the healing process. Sees objects, but cannot count fingers.

June 1. R. V. =  $\frac{2}{c}c$ .

June 5. R. V. =  $\frac{4}{c}c$ , L. V. =  $\frac{2}{L}L$ .

The right visual field is somewhat enlarged, extending infero-nasally, four inches beyond the fixation point, when measured at a distance of one foot.

CASE V. Oct. 3, 1872. J. B., 52 years of age, has atrophy of the left eyeball following an operation for glaucoma some years ago. The right eye is hard and constantly painful, and retains perception of light in only a small portion of the visual field at its extreme temporal periphery.

Oct. 18. Iridectomy upwards, under ether, without accident. Eye dressed with charpie and flannel bandage.

There was no pain until three hours after the operation, when hæmorrhage occurred, causing most sudden and intense pain in the eye, "as if struck with a hammer." The patient cried out with pain until quieted by a large dose of morphine administered hypodermically. The dressing was quickly saturated with blood.

Oct. 20. There has been no severe pain since relieved by the morphine.

This eye was operated upon at the earnest solicitation of the patient, he being fully informed that the chances of any improvement in sight were against him. It was hoped, however, that an iridectomy would relieve the pain and render the eye permanently quiet. An inflammation set in after the hæmorrhage which continued for several weeks, but the eye recovered without atrophy, as also without perception of light.

It is probable that the bleeding was from one or more of the larger choroidal vessels in consequence of the removal of the high degree of pressure to which they had so long been subjected. So sudden and so copious a bleeding would be likely to strip up the retina from the choroid. Hence the loss of perception of light.

CASE VI. Sept. 25, 1877, Mrs. L. H., aged 69, has been greatly troubled with haemorrhoids for several years and is extremely nervous. Her eyes have shown a tendency to "smoky vision" for some time, but were "good enough" until two years ago, when the right eye began to fail rapidly. The vision of the left eye began to be smoky a year ago.

R. V. = Perception of light.

L. V. =  $\frac{20}{xxx}$  with  $+\frac{1}{2}$ .

With the left eye the patient says she frequently sees as though looking through "sticky molasses"—she sees appearances like beads, red, green and blue, with it.

Ophthalmoscopic examination shows complete and deep cupping of right disk, and some slight excavation of the left.

R. Tension much increased.

L. Tension nearly normal.

Oct. 24. Iridectomy upwards on right eye, under ether. Wound enlarged with Graefe's knife. Good-sized keyhole pupil. Atropine, charpie, flannel bandage covered with black silk. No vomiting from the anesthetic.

Nov. 1. The eye did well until to-day, when pain set in and has not been relieved by iced cloths. Ordered a leech to the right temple and codeia to relieve the pain.

Dec. 13. The vision has not risen above perception of light. The left eye has vision as when first seen, and has not changed in any respect.

CASE VII. Jan'y 13, 1879. Mrs. L. B. W., aged 60, states that Dr. Agnew operated upon her left eye for glaucoma in 1862. The eye had been sightless for more than a year, had developed cataract, and was quite painful. The pain was relieved by the operation, and the eye has given her no trouble since.

For the last week she had occasional neuralgic pains below the right eye, and, remembering the history of the left eye, is somewhat anxious.

*Present Condition.* Left eye shows a clean cut iridectomy, upwards and outwards, with cataract, no perception of light.

Right eye,  $V = \frac{20}{x}$ ; emmetropic; visual field perfect; tension normal.

Ophthalmoscopic examination shows a ring of circumdiskal atrophy, and a shallow, saucer-like excavation of the optic disk.

CASE VIII. Jan'y 4, 1876. Joseph G., aged 61, Italian sculptor, has vision  $\frac{20}{c}$  in his right eye, the amblyopia being due to old corneal opacities, and admitting of no improvement with glasses. Four or five weeks ago his left eye became red and painful. He did nothing for it except to bathe it with cold water and with rose water until a week ago when he consulted a physician who gave him atropine and an astringent wash. The eye has since been more painful. The vision is reduced to perception of light. The eyeball is deeply injected, the pupil slightly dilated and sluggish, and the tension much increased. There are numerous delicate corneal opacities, and no view of the fundus can be obtained. The fundus of the right eye cannot be well seen on account of old corneal opacities and myosis.

Jan'y 7. Iridectomy upwards, left eye, under ether.

March 15. The eye has been no better since the operation; if anything worse.

Enucleation, under ether.

The patient recovered free from pain, and has since worn an artificial eye with satisfaction. I saw him in the summer of 1885 when the sight of the right eye was reduced to about  $\frac{6}{c}$  by commencing cataract.

## ESERIN SULPHATE IN GLAUCOMA.

BY DAVID COGGIN, M. D., SALEM, MASS.

In the January number of this JOURNAL the writer reported a case of acute glaucoma that, apparently, was produced by the use of a weak collyrium of atropin, and he now wishes to place on record the great relief, in two instances, that followed the use of eserin in the same affection.

On the 8th of May, Mr. W., aged 55 years, a native of New England, and a shoe-cutter by occupation, sought advice, being so blind he could not walk alone.

Sight poor O. S. for years, eye formerly red and painful—absolute glaucoma. Vision quantitative. Since January, when he could see well, O. D., occasional pain in that eye and brow which was more severe afternoons and in dull weather. “Rainbow-colors”, mornings, O. D. only. Pupil sluggish and is dilated more than that of O. S. which is of normal size but immovable. Anterior chamber shallow. Perforating vessels enlarged. Tension + 2. Cornea somewhat anæsthetic. Sees fingers at 1 metre. No view of fundus. Good projection. Health poor. Acute rheumatism at 11th year. Now has mitral disease.

Loss of sight came on gradually. Two years ago first wore glasses for reading + 2 D. Last ones (second pair) + 4.5. Eserin sulph. (0.10:15.0) was instilled, O. D., and in half an hour the pupil was well contracted, while the vision had risen so he made out Snellen 60.

As is ordinarily the case, pain was pretty severe while the pupil was contracting. Some of the eserin solution (0.05:10.0) was given to the patient and he was sent home, to return on the following day unless his sight should continue to improve, in which case he might wait forty-eight hours.

May 10. Mr. W. walked unaided into the consulting room.

Pupil well contracted still, but the anterior chamber yet shallow. Tn. Reads Snellen 18. at 4 metres with + 2. V.=4 at 4.+4 =Snellen .50 easily. Fundus clearly visible. No cupping of disc. No view of left disc. That eye still has T+.

Considering the feeble condition of the patient owing to his heart-trouble, and the aid to his sight that followed the use of the eserine, and also the fact that his place of residence is but a few miles away, so he could get surgical relief without delay, if necessary, an iridectomy was not advised.

Mr. W. was seen at frequent intervals, however, till the 17th October, when he came last. His vision was normal for distance and he read Snellen .50 easily with + 2. But the field of vision has become contracted upwards and inwards (perimeter not used),

Through the narrow pupil no excavation of the disc was recognized. Anterior chamber still shallow. The eserine had been used (one-half strength) nearly every day. On some days two or three instillations (full strength) were required to allay the pain, which was very acute at times and was accompanied by a dull pain in the left eye. Prismatic colors were often observed, but only while the pain lasted. Both eyes were free from redness. No adhesions between the iris and the lens-capsule, as occasionally occurs, though the sulphate had been used almost continuously for over five months.

Had Mrs. W. been in health, an operation would have been performed early, but if the field of vision should continue to narrow, even then it is likely there will be useful sight so long as it will be required.

The history of the second case is as follows:

7th October, Mrs. B. aged 69 years, a native of Massachusetts, was led into the consulting room to make arrangements for the removal of her "cataracts." Absolute glaucoma of the left eye with no perception of light. Fingers at 0.50, right, T+ 3 both. Good projection, right. No view of either fundus, hence her physician might all the more easily believe the lenses were opaque. O. S. very painful, one hour, six months ago, followed by loss of sight within forty-eight hours.

Constant pain in right eye, brow and temple during the last

three weeks. Eye red and tender and the usual external signs of glaucoma were present. Eserin sulph. was used O. D. (0.05:10.0) and in an hour its myotic action was marked on the iris, though with a considerable degree of pain that cocain did not lessen—but the vision did not improve. She was ordered to use the eserin and report after forty-eight hours.

9th October. Patient could see better in two hours after her return home and an hour later she could tell the time of day. The eye ached all the night, preventing much sleep. Eye is still red. Anterior chamber deeper; pupil fairly contracted. T + 2 (?) V. = Sn. 18, at 4, and Snellen 8. with + 2.5 D. and with + 6 reads Snellen .50.

Eserin no longer painful. Fundus normal. V. O. S. quiet. —no red reflex. To use eserin trice daily in both eyes. No pulsation of vessels.

1st. Nov. No pain for a week. Colors, occasionally by lamplight T + 1 (?). Pupil of normal size—left is still dilated but the left disc is visible and is deeply cupped and is of a blue white color. No sight. Snellen 8. at 4 meters, O. D. +. .75 gives Snellen 6. (+ 5. D. = .50). Redness gone. Field of vision normal but with marked cupping of the disc in spite of the improvement in sight. As is apt to be the case in glaucoma, when there is no pain, the idea of operative interference was not entertained by the patient. But if the disease should progress and the sight should fall away, it is probable that it may yet be acceded to. In the meantime, the use of the eserin is to be continued.

It may not be inopportune to refer to the writer's somewhat limited experience in the treatment of glaucoma. Instances of this disease occurring in hospital patients have been exceedingly rare. Out of several cases of the simple form in but one has permission been granted to perform an operation (a sclerotomy, which seemed to arrest the progress of the disease while the patient lived) although, with increasing loss of sight, an iridectomy has been repeatedly and urgently advised.

In a few patients suffering from chronic glaucoma, an iridectomy relieved the pain and the existing sight was retained, and in some it was improved. Had not several of these cases been



treated to long for "neuralgia in the eye" the gain in vision would, doubtless, have been much greater, of which the following may be taken as an illustration (which was one of the two practically-acute cases in which an operation was performed).

June 25, 1880, Mrs. M., aged 56 years, native born, had her left eye removed, it being staphylomatous and painful. Read Snellen 4, O. D., with + 1.5 at 4 metres.

March 23, 1883, Mrs. M. was taken with severe "neuralgic" pain three weeks before at 7 P. M., in her remaining eye and in half an hour she could see only shadows. Her physician (homoeopathic) wished her to see an oculist, but on her refusing, he gave her pills of "morphine" and later some "quinine," so her daughter stated. Pain constant in eye and head, preventing sleep. Nausea and vomiting a few times. She lived twenty-five miles out and wished to see me. On reaching her home late in the afternoon, the pupil was found widely dilated, T+3. Eye-ball very red. V. quantitative. Being limited for time and also for daylight, eserine was at once instilled, ether given, and satisfactory iridectomy made upwards, a light dressing applied, the frightened relatives recalled and the after-treatment of the eye was explained to the one having the clearest head, and all was over in less than an hour.

Daily reports of the case were received by post. The patient slept for three days after the operation, so great was her relief from pain. 7th May. Mrs. M. walked into my office. Her former H 1.5 had changed to My.—1.5 with which she read Snellen 18 at 4. With +4, she read Snellen 1.25. No cupping of disc, which was rather pale as from atrophy of the smaller vessels. Field of vision deficient up and out. No pain or redness. T+1. Status unchanged when last heard from.

## WAS IT TABETIC ATROPHY?

BY HENRY B. YOUNG, A. M., M. D.

Cases of primary or simple atrophy of the optic nerve are, *per se*, no longer curiosities to the average ophthalmologist. They are unfortunately seen too often, present ophthalmoscopically too uniform a picture and afford too little encouragement for treatment. But the interest in them as indicators of some grave cerebral or spinal trouble constantly increases as more thorough investigation shows a more definite relationship. Some of these relationships have already been mapped out and described; and perhaps none better than that with *tabes dorsalis*. But others yet require the evidence of additional facts as illustrated in numerous individual cases, and to a certain extent it remains to be seen whether the apparent exception can be made to conform to the rules already laid down, or will prove subversive of them.

In this connection I desire to report the case giving rise to the initial question.

Flora S—, aged 8 years, daughter of a farmer in very moderate circumstances, was brought to me December 29, 1883, on account of declining sight which had been complained of by the child for four weeks only, although the family had noticed for perhaps three months that she did not see well. I was at this time just recovering from a week's illness and too weak to examine her properly, so merely noting that she had  $V = \frac{2}{L}$  L. and  $\frac{2}{R}$  R. and that she was apparently well nourished though rather pale, asked that she might be brought another day. Twelve days later (January 10, 1884) I saw her again. Vision was now reduced L. to  $\frac{2}{L}$  and R. to perception of light and that only at one little spot in the upper and outer part of the field. The ophthalmoscope showed whitened discs and white lines along the margins of the larger blood-vessels, but no marks of any in-

flammatory process whatever. The color sense was practically abolished. The diagnosis was plainly atrophy, but what caused it? Schmeichler's paper on eye complications in *tabes dorsalis* was fresh in my mind (just published in the *Archives of Ophthalmology*) and it occurred to me to test the patellar reflex. I did so and found that there was *no* patellar reflex. This led me on. But I found a fair tactile sensibility and normal locomotion; and I could not get any reliable history of shooting pains in the lower extremities or constriction about the abdomen. I prescribed potassium iodide on general principles and gave an unfavorable prognosis—suggesting in a note to the family physician that he should seek further for systemic disease, and at the same time look up the family history.

Twenty-three days later (February 2d) I saw her on her return from St. Louis where she had been taken to consult Dr. John Green. Vision was now reduced L. to  $\frac{1}{60}$  and R. *nil*. Dr. Green discovered nothing new in the eyes, but found Hutchinson's teeth (which I had unaccountably overlooked) and thought that they were more significant of a central cause than the absence of the patellar reflex.

Forty days later (March 12) I saw her for the fourth and last time. The left eye could now count fingers with difficulty at three inches—right eye as before. There was complaint of occasional pain in the head and below the knees. With the eyes closed the body swayed a little in an attempt to stand quietly. The soles of the feet were susceptible to tickling; she walked well and buttoned her dress with ease and accuracy. The diameter of the pupil was 6 mm. with complete iridoplegia, and the right eye was divergent. I have since learned that she was in a short time absolutely blind. The family then moved to the western part of the state and I lost track of them.

Briefly summed up we have *for* a diagnosis of beginning *tabes* the optic nerve atrophy progressing rapidly to completion; lack of association of the movements of the eyes; complete iridoplegia; absence of the patellar reflex and complaint of transitory pain—although too much confidence should not be placed on the patient's statement to this effect at the last interview and for obvious reasons.

*Against* the idea of tabes there is age and sex (unless Hirschberg's cases disprove the prevailing belief that tabes is to be found only in adult life); fair tactile sensibility; good control of legs and arms, and mydriasis.

Of syphilis (to which the teeth would point) it only remains to be said that no knowledge can be had of its common expressions in either parents or grandparents; and they have been interviewed, each one singly and alone and its influence fully explained.

## ON THE INSPIRGATION OF POWDERED JEQUIRITY IN CASES OF TRACHOMA.

BY ADOLF ALT, M. D.

A number of rather disagreeable and even very bad results which I had been unfortunate enough to obtain by the different methods introduced by DeWecker and others of using an infusion of the decorticated and powdered jequirity bean, had made me very sceptical with regard to this remedy, when I accidentally read a notice somewhere, that, I think, Dr. Cheatham, of Louisville, was using inspersion of powdered jequirity with great success. I thought this a very happy substitute for the infusion and have since given it repeated trials. The success has in all cases been complete, and this was undoubtedly due to the possibility of almost accurately dosing, and even almost localising the effect by using the remedy as a powder. I have never dusted it into the eye, as we do with calomel, etc., but have applied the powder with a brush directly to the locality, where I wanted it to act more especially. Its effect can thus be confined to one lid and even to a portion of one lid, if it is carefully applied. Another great advantage which this method has is, that the inflammation does not come on as vehemently as when the infusion has been used and never reaches the same height. I have not confined its use to old cases of trachoma only, but have used it also in more recent cases where the granulations were as yet quite succulent; however, I but very seldom used it where the cornea was as yet totally intact.

The following cases I select from my records to illustrate the foregoing statements.

CASE I. N. F., servant, 18½ years old, came to see me first on account of trachoma during June, 1883. Both upper and lower lids were studded with granulations, both corneæ clear. I

treated her for some time with sulphate of copper in substance, which was followed by a slight improvement. She then disappeared from my office until November, 1884, when she returned (having been treated elsewhere meanwhile) with slight pannus of the left and a macula in the right cornea, considerable irritation and photophobia. All of these symptoms gave way very promptly to the treatment with sulphate of copper in substance, but relapses occurred again and again and new portions of the corneae became involved. She had finally to give up her place as servant and I then determined to try the inspergation of jequirity powder. One application to each lid sufficed to produce what thus far has proven to be a complete cure. The granulations, stillicidium, photophobia and pannus have disappeared and her sight is normal in the left eye at least, the right being considerably impaired by the unchanged macula.

CASE II. H. L., farmer, æt. 24. Patient had sore eyes two years previous to his first visit to me. About two months ago had severe pain and inflammation in both. When I saw him there was an enormous trachomatous inflammation, more especially in the lower lids. The left cornea was very hazy and a portion of iris protruded through its outer upper quadrant. V. L. E. =  $\frac{4}{cc}$ ; R.  $\frac{1.6}{LXX}$ .

Jequirity powder was dusted into the right eye. The croupous inflammation was well developed on the second day and when it gradually disappeared the granula had each singly the grayish look of the croupous membrane. All the granula which appeared thus changed, disappeared totally in the following two weeks. A few being left unaltered, these were dusted again with the powder and disappeared also. After abscision of the prolapse had been performed on the left eye, this was treated in the same manner and with the same result, two applications of the powder sufficing to do away with all granulations and to clear up the cornea quite markedly. Five weeks after I had begun treatment I was able to discharge him with no granulations and V. R. E.  $\frac{20}{XL}$  (small macula) and L. E.  $\frac{20}{cc}$ .

CASE III. E. M., æt. 15, had been under my care for something over nine months on account of trachoma especially of the upper lids, with gradually progressing ulceration of both cor-



neæ and formation of pannus. Cuprum sulphuricum, yellow oxide of mercury, etc., had been applied without any real benefit. The granulations were so succulent that I was afraid to make use of jequirity. But when only a small portion of the pupil downwards remained covered by clear cornea, I did not hesitate any longer and applied the jequirity powder. The effect was an excellent one. The girl, who could neither raise her head nor look at anything without suffering severe pain and causing severe lachrymation, can now walk with head erect and open eyes, in short, is cured. Only small nubeculae remain in the upper third of the cornea. In this case, as in all since my attention has once been drawn to it, the grayish infiltration of the, so to speak, doomed granula was very pronounced.

It would be tedious to relate any more such cases. The conclusions, my experience with the inspersion of jequirity powder in cases of trachoma, has thus far brought me to, are the following:

1. That the inspersion of jequirity powder seems to be a much safer method than the methods usually made use of with this remedy in cases of trachoma.
2. That its effect can well be dosed and confined almost to a small portion of a lid (especially of the lower one).
3. That, in order to manage this effect in the way just mentioned, the powder must be directly applied to the parts to be affected by it.
4. That a peculiar gray infiltration of the granula will, a few days after the inspersion, give an idea what number of granula are going to disappear, and how many about may be expected to remain behind for further applications of the powder.
5. That, since having used the remedy cautiously in the manner just described, I have seen nothing but good and excellent effects from it, and especially in cases in which I should not have dared, from former experiences, to use the infusion of the jequirity bean.

## TRANSLATION.

The following communication concerning the *transplantation of the eye ball* has been made by Dr. Chibret, who it seems is the first one to have claimed a successful performance of this operation, to the *Revue générale d'Ophtalmologie*.

I think it is useful to turn once more to a subject which has excited enthusiasm with some, scepticism with many, and which anyhow has been sympathetically accepted by the educated public.

In fact, the scepticism I have encountered, and especially from the colleagues not practicing ophthalmology, is far from wounding my feelings; it has flattered me particularly to see that the actual evolution of surgery had not yet prepared the minds in such a manner as to accept easily the transplantation of an eyeball.

I have asked myself why the idea to try such an operation had not until now come into anyone's head, and I found the reason to be the following:

We begin the physiological experiments on animals before we try them on man. I have tried to follow this logical manner and have had to give it up on account of material difficulties.

The rabbit, our common sufferer, has such a rudimentary capsule of Tenon that after enucleation I found it impossible to find it again in order to stitch the eyeball into it, as I had proposed to do.

With other animals the transplantation presents great difficulties and necessitates special arrangements; moreover, we have always to count with accidents which happen after the operation from unrest of the animal, and which may modify the result.

I had thought of using the monkey, as he is most similar to man, but it is difficult to procure large monkeys, and their indocility is well known.

At this period of my trials and reflections an idea entered my

head which was surgically speaking paradoxical but in fact logical and mother to the performance of the operation of transplantation.

If a gardener wants to transplant a tree successfully, he looks for soil which embraces the best conditions of vegetable nourishment. The chances of success are the better the more the nutrition of the tree gains by the change of soil.

Taking this into consideration and going even so far as to neglect the differences of order and species, I thought the rabbit's eye, which is badly equipped, (!Translator) and nourished in its rudimentary capsule, would find in the human and well developed capsule of Tenon, a favorable soil for its nourishment after having been transplanted.

This conviction having once become deeply seated in my mind, I waited for a favorable occasion and resolved to make use of it.

I must, however add, that the first idea of such a transplantation suggested itself to me in consequence of the excellent results which the irrigations with a corrosive sublimate solution of one in 2000 give after an enucleation. With this remedy the capillary haemorrhage is arrested, the surfaces become rosy and free from blood-clots. Union, therefore, takes place in twenty-four hours and without suppuration.

I could not keep myself from thinking that it would be to be regretted not to make use of these excellent conditions, and I determined to attempt the union of the capsule to another eyeball instead of allowing it to collapse and thus grow together in itself.

There was no use in thinking of transplanting an eyeball from man to man; this could only be had from people sentenced to death. There remained nothing but the eyeball of an animal.

These many considerations; slowly ripened during several months, have brought us to perform on the 4th of May, 1885, the operation which was published in the *Revue générale d'Ophthalmologie*. My excellent friend, Dr. E. Meyer, who knew of my researches, was the cause of my no longer keeping them secret, and the thought that the whole world could be benefited by it, led me to the publication.

Without again going into details, I wish to give my actual thoughts concerning transplantation.

The results, thus far obtained, have been: 1. Perfect union between the eye of a rabbit and Tenon's capsule in man. 2. Motility of the eyeball on the fifth day, when the sutures were removed. 3. Perfect restoration of the sensibility of the cornea on the tenth day, although not even a slight sensibility was to be noticed the evening before. 4. Conservation of the transparency of the refractive media, and especially of the crystalline lens, until the sixteenth day.

On the other hand there were some corneal ulcers produced by the pressure of the thread at the limbus, and finally necrosis of the cornea was the result. The now unprotected iris was then necrosed in turn, giving rise to a prolapse of the crystalline lens. Thus I had occasion to rupture the anterior lens-capsule and to extract the transparent crystalline lens without prolapse of the vitreous body which also had retained its transparency.

A fortnight later on the loss of substance due to the necrosis of the cornea was refilled by cicatricial tissue and the patient could go home.

I want to draw particular attention to the well pronounced and rapid return of the sensibility of the cornea on the tenth day. What we have been taught by the optico-ciliary section, did not seem to warrant a similar result.

For future operations we will have to change the operative procedure in such a way as to prevent the contact between the cornea and the sutures. I was content with inserting the cornea within the borders of the human conjunctiva, lined with the capsule, and I obtained this result by one suture "*en bourse de roulé*" as it is used after enucleation.

It will be well to preserve the conjunctiva around the limbus on the animal's eyeball, to unite that with the free edges of the human capsule, and, if it should be necessary to add a suture "*en bourse*" in order to fasten the eyeball better, this suture must pass between the cornea and the equator so as to keep away from the cornea and to avoid the accident which has been the obstacle to the complete success of my operation.

The subject is full of questions which cannot be answered.

What will become of the transplanted eyeball? Is it necessary to confine ourselves to rabbit's eyes?

I have thought of pig's eyes, which are considered to be much like human eyes. I have enucleated a number of them from small and large animals. They have a well developed capsule of Tenon, but their cornea is enormous; their diameters exceed those of the human cornea by four or five mm. The eyeball is a little more voluminous than the human eyeball. These conditions are not very favorable. In fact, the animal's eye must easily fit into the human capsule, and it must therefore be smaller than the enucleated eyeball, because we have to take into account the retraction of the capsule.

The rabbit's eye is in very favorable conditions for transplantation. In spite of the distance which severs the rodents from man, my operation shows that it is possible to use them successfully.

When about to finish these pages—and the reader will easily divine with what conclusions they should have ended—I received a letter from my patient telling me of severe pains in the transplanted eye, in the forehead and in the temple on the same side. These pains have lasted for three weeks (from the 20th of July to the 10th of August), and there was an abundant suppurative discharge. A little time after I had occasion to examine the patient and I could feel the shrunken sclerotic of the rabbit's eye. The citatrical tissue, which contained lime deposits and which had filled the opening caused by the sloughing of the cornea, must have been eliminated by suppuration. Might this not have caused a sympathetic inflammation? Could it not have become necessary to remove the eyeball which had been transplanted so carefully? These questions arise in my mind and do not allow me, for my own part, to make further experiments on man. At the same time I think it my duty, after having initiated this transplantation, to say a warning word from the moment that I am aware that there may be some danger in it. I think I am free from reproach in my case, but my conscience would not be quite easy, if I should allow myself to make new attempts.

I think it quite possible to experiment and collect numerous experiences on animals, as the pig, dog and rabbit. By then al-

lowing the animal on whom the operation has been successful to live, we would find out what becomes of the eye after several months. If the transplanted organ remains intact, then we will have a right to return to man.

I, therefore, think that this question should be transferred from the clinic to the laboratory.

Since I have neither the time nor the necessary surroundings, I leave the further advancement of this question, which promises to be so rich in scientific and practical results, to those who are in better circumstances for doing it.



## CORRESPONDENCE.

The following letter is of interest in connection with Dr. Young's paper in this number.

DEAR DOCTOR.—Since writing the report which I herewith enclose, I have accidentally heard indirectly that the child's health is gradually failing. But I have also heard where the family is located and propose writing to a professional friend of mine in that neighborhood to see the case and report to me the general condition.

May be the evidence which can now be had will settle the question of etiology beyond peradventure.

Very truly yours,  
H. B. YOUNG.

BURLINGTON, IOWA.

DEAR DOCTOR.—In your last issue of the *AMERICAN JOURNAL OF OPHTHALMOLOGY*, p. 210, I notice a "peculiar formula" for a glass, by Dr. Fox.

The vision obtained by the glass (+ 10 D s.  $\odot$  + 3 D cy. ax.  $180^\circ$   $\odot$  + 2 D cy. ax.  $50^\circ$ ) is excellent, but allow me to say that practically a sphero-cylinder will answer the same purpose: viz: + 11 D s.  $\odot$  + 3 D cy. ax.  $15^\circ$ .

The two + cylinders, + 3 D cy. ax.  $180^\circ$   $\odot$  + 2 D cy. ax.  $50^\circ$ , in Dr. Fox's "peculiar glass" are neutralized by a - 1 D s.  $\odot$  - 3 D cy. ax.  $15^\circ$ , which everyone can verify with trial lenses, and there is no doubt that the above glass (+ 11 D s.  $\odot$  + 3 D cy. ax.  $15^\circ$ ) will give the same vision (Perhaps the axis of cylinder is a trifle more or less than  $15^\circ$ ).

Respectfully yours,  
DR. PAUL B. WALDMAN.

READING, PA.

ADOLF ALT, M. D.:

*Editor American Journal of Ophthalmology.*

*Dear Sir:* I notice in your journal for October, 1885, a correspondence in relation to the production of a lens from a formula calling for a bicylindrical and spherical surface, which Dr. Fox had found necessary for a case, and reported by him at the last meeting of the American Ophthalmological Society. I was not at the meeting and was unable to state that such a pair of lenses or spectacles had been made for me by J. L. Borsch, Esq., of Philadelphia, in December, 1881; the patient was seen at the Eye Clinic, Jefferson Medical College Hospital. Similar lenses have been provided for cases by Mr. Borsch since then.

Prior to this time I had been unable to provide cases of mixed astigmatism requiring a presbyopic correction with a spectacle combining both corrections. My first case was with the plus and minus cylinders at right angles, and the presbyopic correction added; he could have had a sphero-cylinder lens, but he preferred the action of the bicylindrical surfaces with the plano-spherical surfaces added, and it gave me an opportunity to try what Mr. Borsch so ingeniously devised for me. In the cases since provided with these formulas, the angles of the plus and minus cylinders have been other than at right angles to each other with the plano-spherical added. I presume the spectacles made for Dr. Fox by Mr. Borsch are on the same plan as those he made for me, and as your correspondent asks Dr. Fox how such lenses are ground, I leave him to answer. Claiming for myself an earlier production of such a lens or spectacle for the advantage of correcting cases of mixed astigmatism (irregular?) with presbyopia, where the plus and minus cylinders are not at right angles to each other, and no sphero-cylindrical combination will give an approximate or the same result,

Very respectfully,

WM. L. LITTLE, M. D.

PHILADELPHIA, PA.